

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

**Claims 1-9 (Cancelled).**

10. (Currently Amended) An audio apparatus comprising a modulator for modulating a first ultrasonic signal with an audio signal to provide a second ultrasonic signal lying within a first frequency range; a transducer for converting the second ultrasonic signal into an ultrasonic pressure wave for transmission into a non-linear medium to allow demodulation of the ultrasonic pressure wave and thereby generate an audio pressure wave representative of the audio signal wherein the transducer has conversion characteristics that determine ~~a relationship of~~ how an amplitude of the ultrasonic pressure wave ~~to varies with an amplitude of~~ the second ultrasonic signal across the first frequency range; processing means for modifying the audio signal to compensate for the demodulating properties of the non-linear medium; and means for modifying the audio signal to compensate for ~~the a variation, with frequency, of the~~ conversion characteristics of the transducer across the first frequency range.

11. (Previously Presented) An audio apparatus according to claim 10, wherein the first ultrasonic signal is amplitude modulated with the audio signal.

12. (Previously Presented) An audio according to claim 10, wherein the first ultrasonic signal is equal to or greater than 40 kHz.

13. (Previously Presented) An audio apparatus according to claim 10, wherein the processing means comprises a double integration filter and a square root operator.

14. (Previously Presented) An audio apparatus according to claim 13, wherein the means for modifying is disposed between the double integration filter and the square root operator.

15. (Previously Presented) An audio apparatus according to claim 10, wherein the means for modifying is a digital filter.

16. (Previously Presented) An audio apparatus according to claim 10, wherein the characteristics of the means for modifying are empirically derived by tone adjustment.

17. (Previously Presented) An audio apparatus according to claim 10 comprising a radiotelephone.

18. (Previously Presented) An audio apparatus according to claim 10 comprising a portable radio device.

19. (Previously Presented) A method for transmitting an ultrasonic pressure wave into a non-linear medium for demodulation comprising:

modulating a first ultrasonic signal with an audio signal to provide a second ultrasonic signal;

converting, using a transducer having conversion characteristics, the second ultrasonic signal into a ultrasonic pressure wave for transmission into a non-linear medium for demodulation and consequent generation of an audio pressure wave representative of the audio signal;

modifying the audio signal, before modulating the first ultrasonic signal, to compensate for the demodulation properties of the non-linear medium; and

modifying the audio signal, before modulating the first ultrasonic signal, to compensate for the conversion characteristics of the transducer.

20. (Currently Amended) Audio apparatus comprising a modulator for modulating a first ultrasonic signal with an audio signal to provide a second ultrasonic signal lying within a first frequency range; a transducer for converting the second ultrasonic signal into an ultrasonic pressure wave for transmission into a non-linear medium to allow demodulation of the ultrasonic pressure wave and thereby generate an audio pressure wave representative of the audio signal wherein the transducer has conversion characteristics that determine a relationship of how an amplitude of the ultrasonic pressure wave to varies with an amplitude of the second ultrasonic signal across the first frequency range; processing means for modifying the audio signal to compensate for the demodulating properties of the non-linear

medium; and a digital filter for modifying the audio signal to compensate for ~~the~~ a variation, with frequency, of the conversion characteristics of the transducer across the first frequency range.

21. (Previously Presented) An audio according to claim 20, wherein the first ultrasonic signal is equal to or greater than 40 kHz.

22. (Previously Presented) An audio apparatus according to claim 21, wherein the processing means comprises a double integration filter and a square root operator.

23. (Previously Presented) An audio apparatus according to claim 22, wherein the means for modifying is disposed between the double integration filter and the square root operator.

24. (Previously Presented) An audio apparatus according to claim 20, wherein the characteristics of the means for modifying are empirically derived by tone adjustment.

25. (Previously Presented) An audio apparatus according to claim 20 comprising a radiotelephone.

26. (Previously Presented) An audio apparatus according to claim 20 comprising a portable radio device.

27. (New) An audio apparatus according to claim 10, wherein a resonant frequency of the transducer is in the first frequency range.

28. (New) An audio apparatus according to claim 10, wherein the compensation for the variation with frequency of the conversion characteristics across the first frequency range is determined empirically.

29. (New) An audio apparatus according to claim 20, wherein a resonant frequency of the transducer is in the first frequency range.

30. (New) An audio apparatus according to claim 20, wherein the digital filter has empirically determined characteristics that compensate for the variation with frequency of the conversion characteristics across the first frequency range.